Sample Question Paper

(TERM–II) 2021–22

Class X
SCIENCE (086)

Max Marks: 40 **Time allowed: 2 hours**

General Instructions:

i. All questions are compulsory.

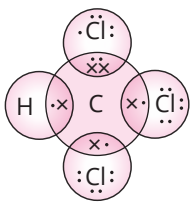
ii. The question paper has **three sections** and **15 questions**. All questions are compulsory.

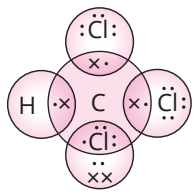
iii. Section–A has 7 questions of 2 marks each; Section–B has 6 questions of 3 marks each; and Section–C has 2 case based questions of 4 marks each.

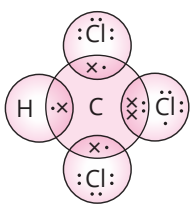
iv. Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

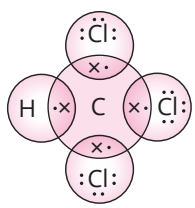
SECTION – A

1. a. Which of the following correctly represents the electron-dot structure of chloroform?

i. 

ii. 

iii. 

iv. 

b. Why does carbon form the largest number of compounds?

2. The positions of elements A to D are given in the Periodic Table containing only the main group elements.

A				B			
C				D			

a. Which of the elements is the most metallic?

b. Which of the elements has the smallest atomic radius?

3. a. Budding is the process of asexual reproduction by certain lower group of animals. Name two organisms that reproduce by this method.

b. Give one example each of the plants which reproduce by vegetative propagation from the following parts.

i. Stem ii. Leaves

4. a. Testes are extra-abdominal in the human male. Why?

   b. Name the parts of human male reproductive system which contribute fluid to the semen.

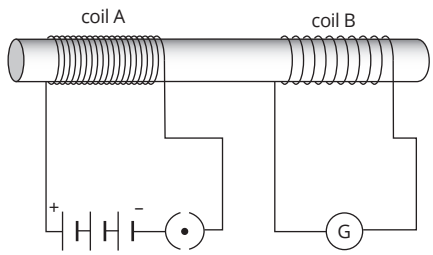
5. In an experiment, pea plant having violet-coloured (W) flowers were bred with pea plant having white (w) flowers. Half of the progeny showed plants with violet-coloured flowers and half of them were with white-coloured flowers.

   What was the genotype of parent plant with violet-coloured flowers? What is the name of this cross?

   OR

   Organism A and organism B have a common ancestor. Can you list out four biochemical evidences that could prove the common ancestry of organism A and B?

6. In the set-up given below, observe the deflection in the galvanometer and write what happens when

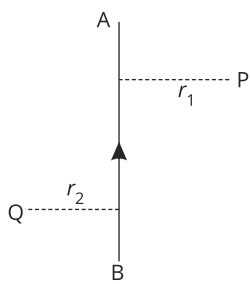


   a. current is flowing steadily in coil A.

   b. coil A is disconnected from the battery.

   OR

   AB is a current-carrying conductor in the plane of the paper as shown in the figure below.



   What are the directions of magnetic field produced by it at points P and Q? Given $r_1 > r_2$, where will the strength of the magnetic field be larger. Justify your answer in each case.

7. Which of the following food chains is more advantageous in terms of energy to top carnivores? Explain.

   a. Food chain A:

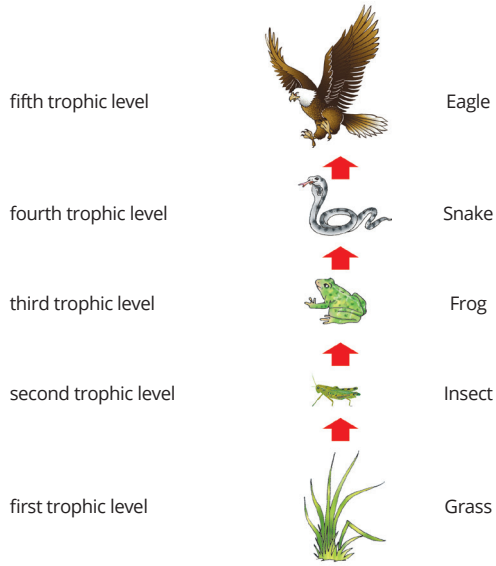
      Grass ⟶ Deer ⟶ Tiger

   b. Food chain B:

      Plants ⟶ Grasshopper ⟶ Frog ⟶ Snake ⟶ Eagle

   OR

   Consider the given figure. If the frog has 30 J of energy available in this food chain, how much energy was originally available from grass? Explain. How much energy will be available for snake?



SECTION – B

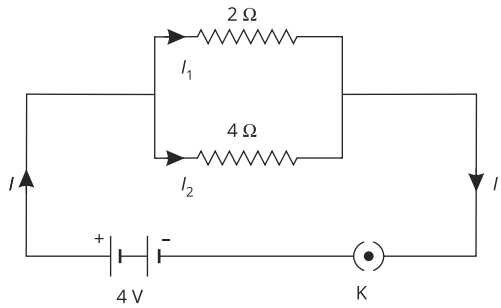
8. Based on the group valency of elements, state the formula for the following giving justification for each:
   a. Oxides of Group 1 elements.
   b. Halides of the elements of Group 13.
   c. Compounds formed when an element of Group 2 combines with an element of Group 16.
9. a. State the reason why carbon can neither form C^{4+} cations nor C^{4-} anions, but forms covalent bonds.
   b. State the reasons to explain why covalent compounds
      i. are bad conductors of electricity.
      ii. have low melting and boiling points.

OR

   a. A cyclic compound has the molecular formula C_6H_{12}. Draw its structure and find the number of covalent bonds in it.
   b. Draw the possible structures of isomers of butane, C_4H_{10}.
10. If we cross pure-bred tall (dominant) pea plant with pure-bred dwarf (recessive) pea plant we will get pea plants of F_1 generation. If we now self-cross the pea plant of F_1 generation, then we obtain pea plants of F_2 generation.
    a. What is the phenotype and genotype of F_1 generation?
    b. State the ratio of tall plants to dwarf plants in F_2 generation.
11. a. A lamp has a rating of 100 W at 220 V. What current is drawn from the line at 220 V supply voltage? (1 Mark)
    b. An electric kettle draws a current of 5 A for 5 minutes. If the resistance of its element is 80 W, calculate the electric energy drawn by the kettle in kilojoules. (2 Marks)
12. When two resistors of resistances R_1 and R_2 are connected in parallel, the net resistance is 3 Ω. When connected in series, the resistance is 16 Ω. Calculate the values of R_1 and R_2.

OR

With the help of the figure given below, find the currents flowing through the resistors and total current in the circuit.



13. a. Explain how the harmful components of sunlight are prevented from reaching the earth's surface.
    b. Define ODS and state their harmful effects.

SECTION – C

This section has 02 case-based questions (14 and 15). Each case is followed by 03 sub-questions (a, b and c). Parts a and b are compulsory. However, an internal choice has been provided in part c.

14. Rita found a case study to understand the inheritance pattern of genes. It is given that, in an experiment, sweet pea plants having axial flowers with round seeds (AARR) and terminal flowers with wrinkled seeds (aarr) are crossed.
    a. State the phenotype of F_1 progeny. (1 mark)
    b. Give the phenotypic ratio of F_2 progeny. (1 mark)
    c. What are the phenotypes of F_2 progeny produced by the self-pollination of F_1 progeny. (2 marks)

    OR

    Name and explain the law induced by Mendel on the basis of the above observation. (2 marks)

15. A coil of insulated copper wire is connected to a galvanometer. What would happen if a strong bar magnet is
    a. pushed into the coil?
    b. withdrawn from inside the coil?
    c. held stationary inside the coil?

    OR

    Name the phenomena involved. Name some devices based on this phenomena.